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(56) Documents cited  
GB 2236681 A GB 1092378 A WO 88/09681 A1

(58) Field of search  
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INT CL<sup>5</sup> A61M, A62B  
Online databases: WPI

(54) Mask with means for passing out the exhalation of air

(57) A mask comprising a body 1 attached with a layer 8 of air filtering lining with vents 9 thereon, and two belts 11, 12 connected to said body 1 at two opposite sides for securing it to the head over the nose and mouth to prevent inhaling harmful substances, wherein said body 1 has a nose portion 5 worn over the nose, an oval hole 6 spaced from said nose portion 5 in a lower place, a flexible taper pipe 2 connected to hole 6 for passing out the expiration of air from the lungs, and a protective covering 3 over said pipe 2. Said pipe 2 may be made from a flexible rubber or plastic material having capillary tubes or pieces of films on the inner wall thereof for passing out the expiration of air from the lungs, which block up the air passage during the act of drawing breath into the lungs.

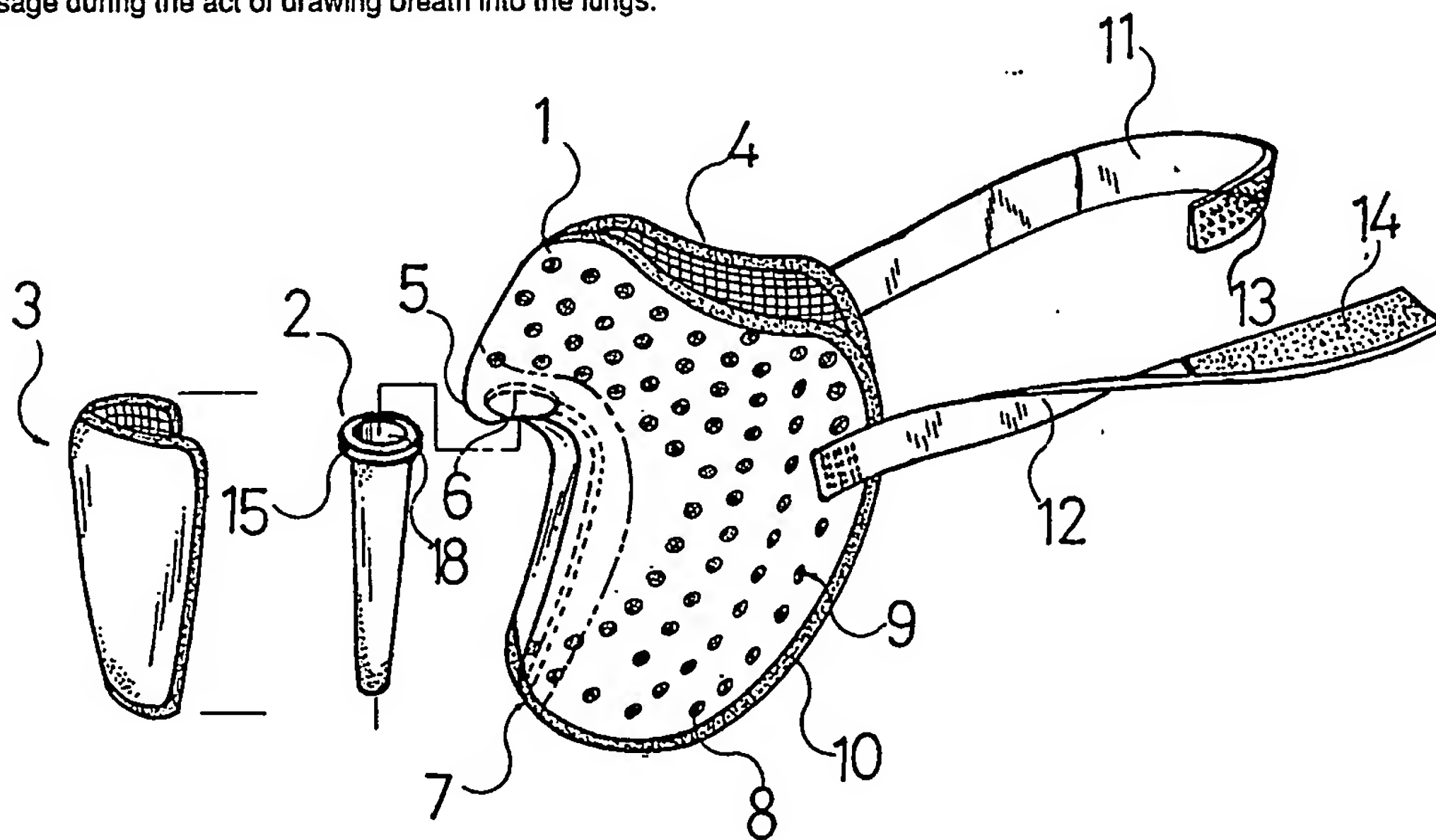


FIG.1

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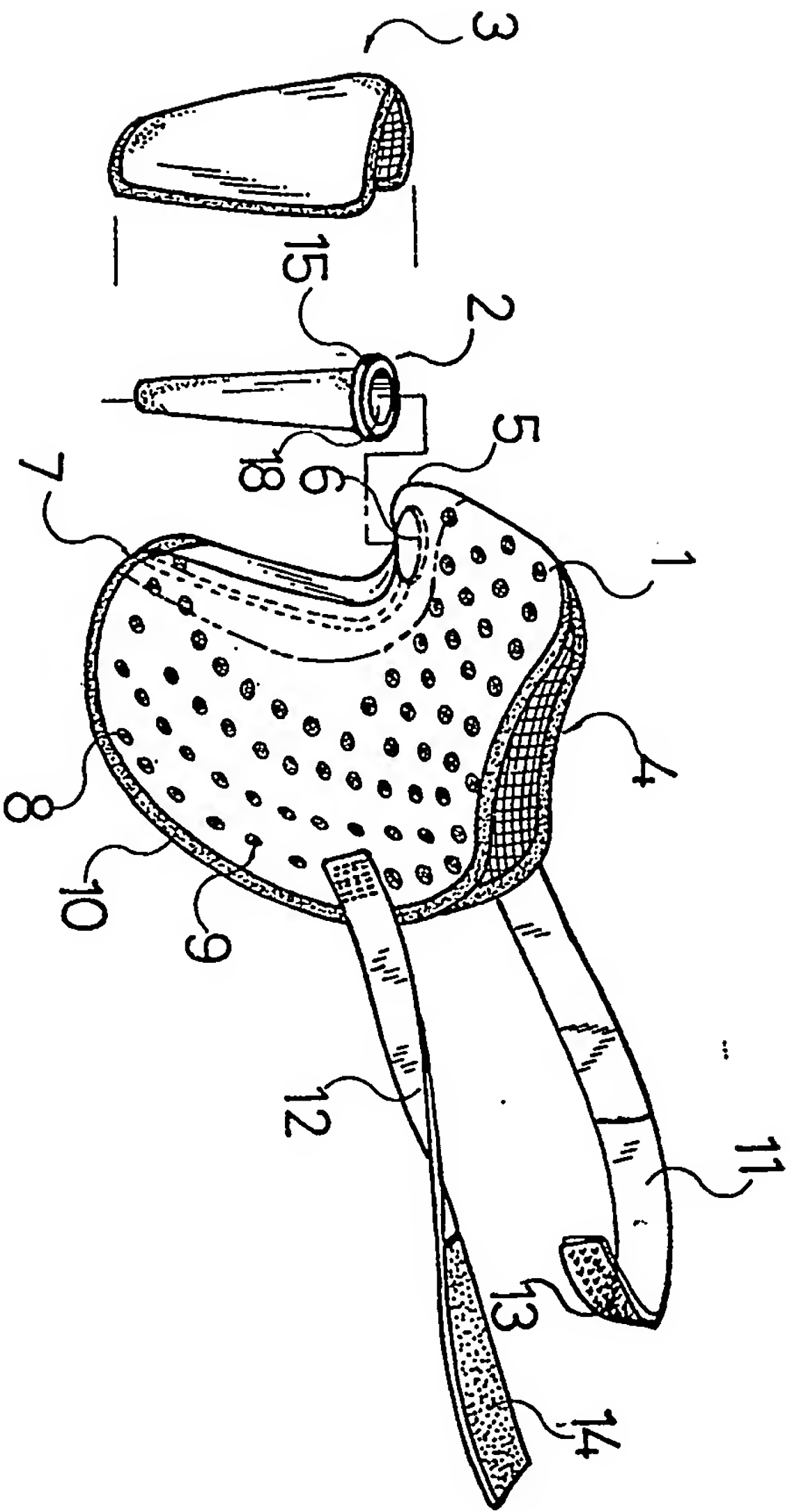


FIG. 1

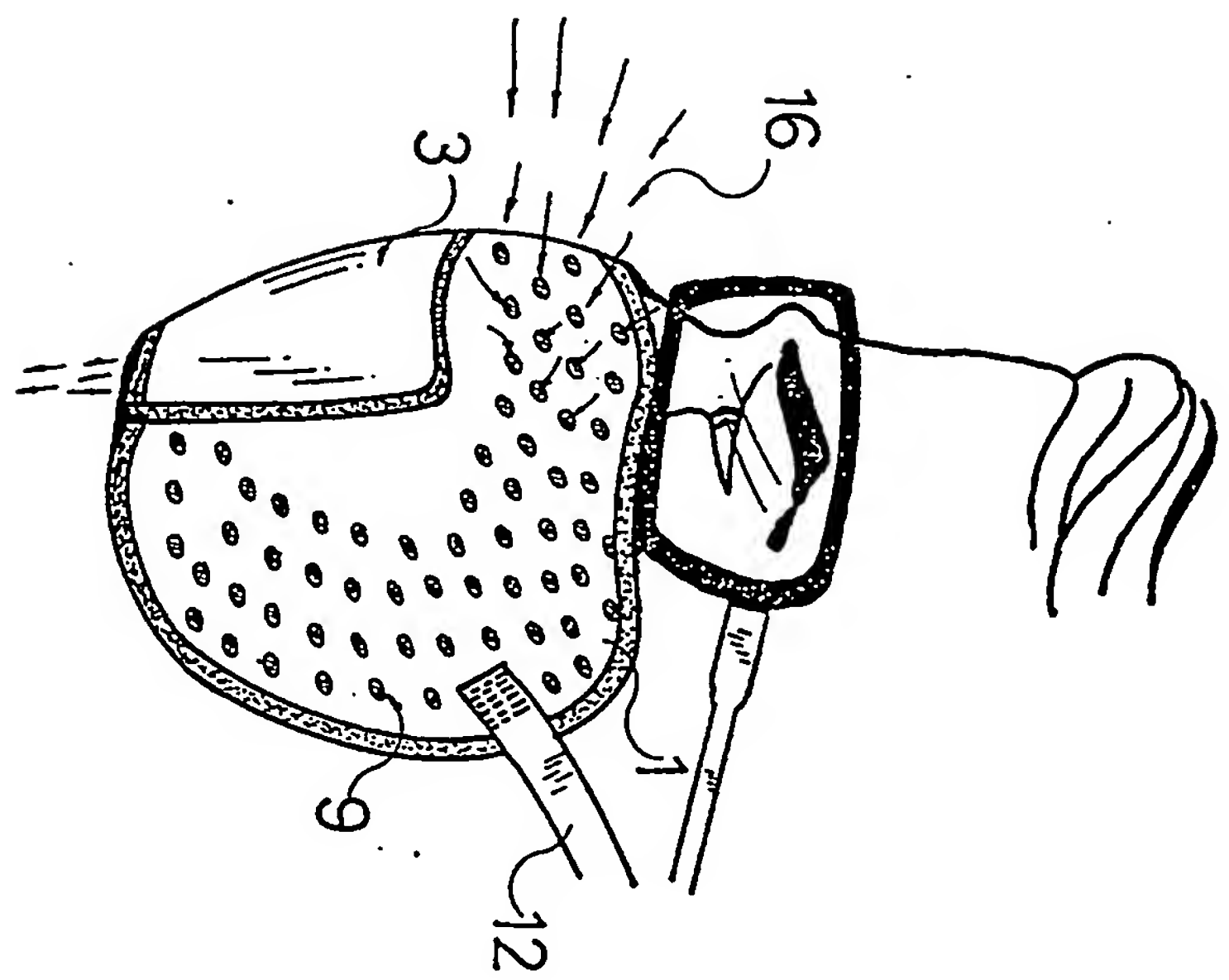


FIG. 2

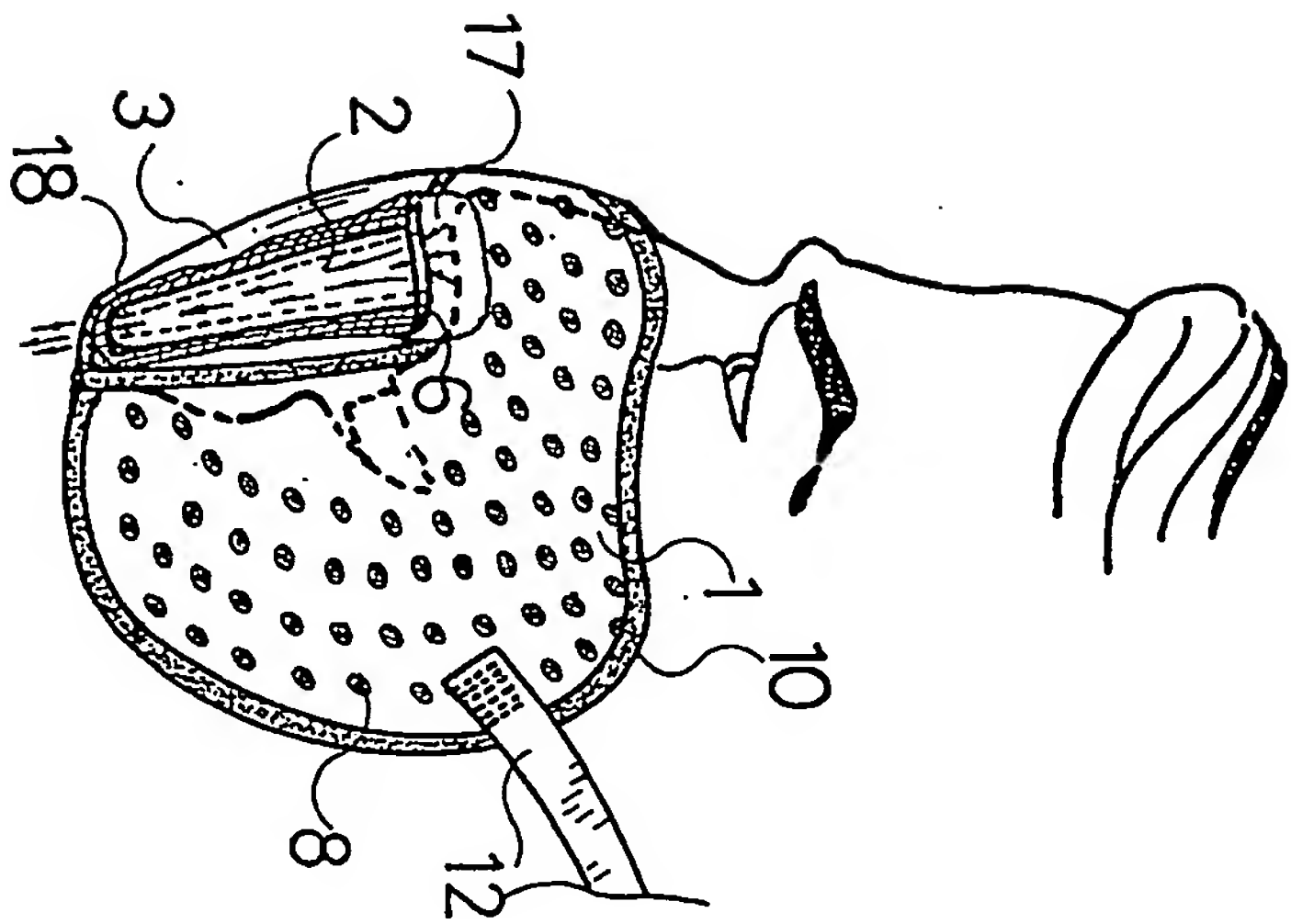


FIG. 3

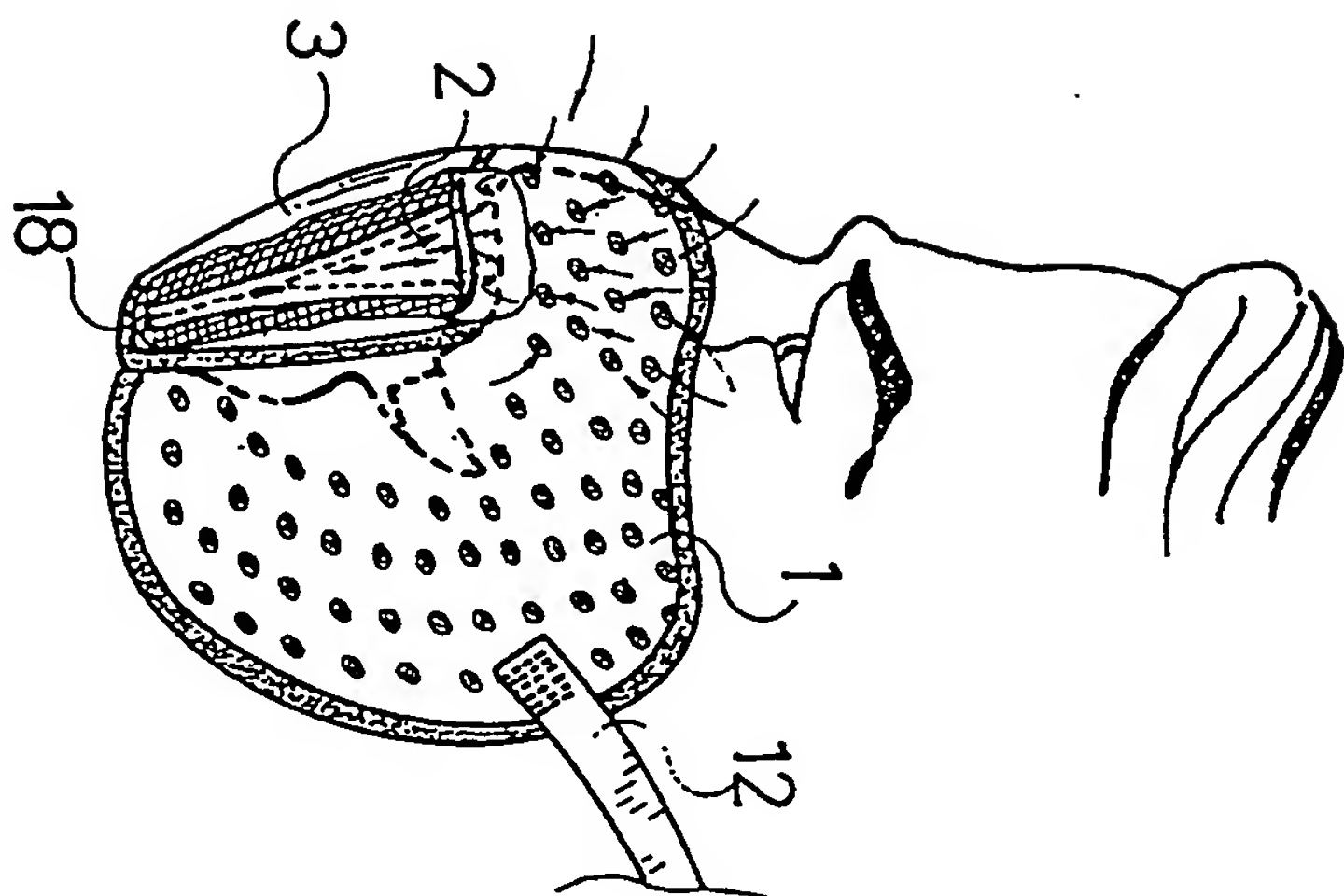


FIG. 4

MASK WITH MEANS FOR PASSING OUT THE EXPIRATION OF AIRBACKGROUND OF THE INVENTION

The present invention relates to masks. More particularly, the present invention relates to a mask worn over the nose and mouth to prevent inhaling harmful substances, which has means for passing out the expiration of air from the lungs.

Various masks have been known and used for different purposes. In order to effectively prevent inhaling harmful substances, filtering substances or devices may be provided. However, wearing a mask for a long length of time makes one feel uncomfortable. Further, during the act of expiration, hot moisture is simultaneously carried out of the nose. If an user worn a pair of glasses, the glasses may be fogged by the expiration of air from the lungs. When a pair of glasses is fogged, it must be cleaned so as not to obstruct the sight.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the aforesaid circumstances. It is therefore an object of the present invention to provide a mask

which has means for passing out the expiration of air from the lungs. It is another object of the present invention to provide a mask which eliminates the problem of fogging during the act of breathing out. It is  
5 still another object of the present invention to provide a mask which helps the user breathe smoothly. It is still another object of the present invention to provide a mask which is easy and inexpensive to manufacture. It is still another object of the present invention to  
10 provide a mask which has many uses.

According to the present invention, there is provided a mask comprised of a body attached with a layer of air filtering lining with vents thereon, and two belts connected to said body at two opposite sides  
15 for securing it to the head over the nose and mouth to prevent inhaling harmful substances. The air filtering lining may be comprised of active carbon or cotton filter for removing harmful substances from the air passing therethrough. Releasable fastening means  
20 may be used for connecting the belts together. The body has a nose portion worn over the nose, an oval hole spaced from the nose portion in a lower place, a flexible taper pipe connected to said oval hole for

passing out the expiration of air from the lungs, and a protective covering covered over the flexible taper pipe. The flexible taper pipe may be made from a flexible rubber or plastic material having capillary tubes or pieces of films on the inner wall thereof for passing out the expiration of air from the lungs, which block up the air passage during the act of drawing breath into the lungs.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded view of the preferred embodiment of the mask embodying the present invention;

Fig. 2 illustrates an use of the present invention worn over a person's nose and mouth for protection;

Fig. 3 is a partly sectional view of Fig. 2, showing that the expiration of air from the user has been sent out of the mask through the flexible exhaust pipe; and

Fig. 4 is another partly sectional view of Fig. 2, showing that currents of outside air have been drawn in the mask.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Fig. 1, a mask in accordance



with the present invention is generally comprised of a body 1, an exhaust pipe 2, and a protective covering 3. The body 1 may be made from non-woven cloth or any of a variety of materials suitable for filtering the air, in size and shape suitable for covering over the nose and mouth smoothly comfortably. As illustrated, the body 1 comprises a curved top edge 4, a nose portion 5 extending downwards from said curved top edge 4 at the middle, a pipe holder 6 in an oval shape inside said nose portion 5 at a bottom for holding the exhaust pipe 2, a curved surface portion 7 bilaterally extending downwards from said nose portion 5 for securing the protective covering 3, a layer of air filtering lining 8, a plurality of vents 9 through said air filtering lining, a border edge 10 around the peripheral edge thereof, and two opposite fastening belts 11, 12 at two opposite sides for fastening to the head by male and female fastening elements 13, 14. The air filtering lining 8 may be comprised of active carbon or cotton filter for removing toxic gas from the air passing therethrough. Male and female velcro strips may be used for fastening the fastening belts 11, 12 so that they can be conveniently resealably connected together for securing the mask to the head. The exhaust pipe 2

is made from a flexible rubber or plastic material in the shape of a taper pipe suitable for inserting through the pipe holder 6, having an outward flange 15 around the wider end thereof and defining an air passage 18 therein. The outward flange 15 is slightly bigger than the inner diameter of the pipe holder 6 so that the exhaust pipe 2 can be firmly supported on the exhaust pipe 2 when it is inserted therein. The protective covering 3 may be made from a non-woven cloth or any suitable material for protecting the exhaust pipe 2. It may be secured to the body 1 over the curved surface portion through the process of stitching or press sealing.

Referring to Figs. 2, 3 and 4, the operation and effects of the present invention will be understood from the following description. By fastening the fastening elements 13, 14 of the belts 11, 12 together, the mask 16 is firmly secured to an user's head and covered over his (her) nose and mouth. When the mask 16 has been worn over an user's nose and mouth, a gap 17 is maintained between the user's nose and the pipe holder 6. Therefore, outside air can be drawn through the vents 9 and the gap 17 into the user's lungs; the expiration of air from the user's lungs can

be exhausted out of the mask 16 through the exhaust pipe  
2 (see Fig. 2 and 3). This eliminates the problem of  
fogging on the glasses caused by the expiration of hot  
air from an user's lungs. During the act of drawing  
5 breath into the lungs, as shown in Fig. 4), the air  
passage 18 of the exhaust pipe 2 will be automatically  
blocked by the capillary tubes or pieces of films on the  
peripheral wall therein and the moisture left from  
previous expiration of air. Therefore, only the air  
10 which passes through the vent 9 will be drawn into the  
lungs, i.e. inhaled air is treated through the  
filtration of the layer of air filtering cloth 8.

What is claimed is:

5           1. A mask comprising a body attached with a  
layer of air filtering lining with vents thereon, and  
two belts connected to said body at two opposite sides  
for securing it to the head over the nose and mouth to  
prevent inhaling harmful substances, and characterized  
in that said body has a nose portion worn over the nose,  
an oval hole below said nose portion, a flexible taper  
pipe connected to said oval hole for passing out the  
expiration of air from the lungs, and a protective  
10 covering covered over said flexible taper pipe, said  
flexible taper pipe having one-way valve means for  
passing out the expiration of air from the lungs.

15           2. A mask according to claim 1 and as herein  
described.

          3. A mask as herein described with reference  
to, and as shown in, the accompanying drawings.

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**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

GB 9202883.6

**Relevant Technical fields**

(i) UK Cl (Edition L ) A5T (TCX, TCT, TCG, TCKA)

(ii) Int Cl (Edition 5 ) A61M; A62B

**Search Examiner**

M SIDDIQUE

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

**Date of Search**

5 MARCH 1993

Documents considered relevant following a search in respect of claims 1 TO 3

| Category<br>(see over) | Identity of document and relevant passages  | Relevant to<br>claim(s) |
|------------------------|---|-------------------------|
| Y                      | GB 2236681 A (COLE) air-permeable filtering lining 2; holes 9 in nose portion; non-return exhalation valve 12; belts etc      | 1-3                     |
| Y                      | GB 1092378 (CHAPMAN) air-permeable filtering lining 8; exhaling pipe or tube with one-way valve; belts 13, page 1 lines 67-75 | 1-3                     |
| Y                      | WO 88/09681 A1 (BISHOP) mask with tapering tubes 18 adjacent and covered by nose-embracing portion of mask                    | 1-3                     |

| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|--|----------------------|
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#### Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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